What is claimed is:

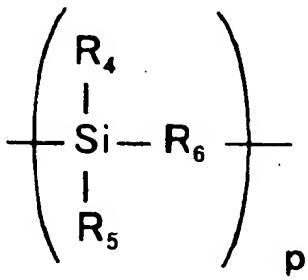
1. A composition comprising:

a siloxane resin;

a silicon compound substantially consisting of silicon, carbon and hydrogen, wherein the number ratio of carbon to silicon atoms forming an -X- bond (wherein X is $(C)_m$ (where m is an integer in the range of from 1 to 3), or a substituted or unsubstituted aromatic group with 9 or less carbon atoms) in the main chain of one molecule is in the range of from 2:1 to 12:1; and

a solvent.

2. A composition according to claim 1, wherein said silicon compound has a structure represented by formula (2):

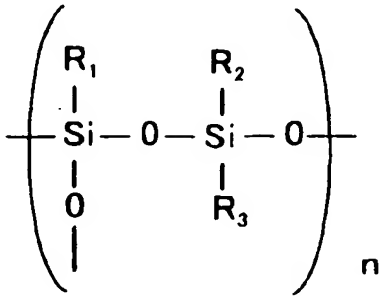


... (2)

(wherein R_4 and R_5 are each, same or different, H, an aliphatic hydrocarbon group with 1 to 3 carbon atoms, or a substituted or unsubstituted aromatic hydrocarbon group with 6 to 9 carbon atoms; R_6 is an aliphatic hydrocarbon group with 1 to 3 carbon atoms, or a substituted or

unsubstituted phenylene group; and p is an integer in the range of from 20 to 1,000).

3. A composition according to claim 1, wherein said siloxane resin has a structure represented by formula (3):



... (3)

(wherein R_1, R_2, and R_3 are each, same or different, hydrogen, fluorine, a methyl group or an -O- group; and n is an integer in the range of from 5 to 1,000).

4. A composition according to claim 1, wherein said siloxane resin is obtained:

by subjecting to a heat treatment a mixture containing a tetraalkoxysilane (a) and an alkyltrialkoxysilane and/or trialkoxysilane (b) at a molar ratio (a:b) of 0:1 to 1:0; and

by releasing from 100 to 400 moles of alcohols out of 100 moles of (a + b), the total of the tetraalkoxysilane (a) and the alkyltrialkoxysilane and/or trialkoxysilane (b).

5. A composition according to claim 1, wherein the carbon concentration in said siloxane resin is in the range of from 1 to 80 atom% based on the total atoms of the siloxane resin.

6. A composition according to claim 1, wherein the concentration of hydrogen atoms directly bonded to silicon in said siloxane resin is in the range of from 1 to 25 atom% based on the total atoms of the siloxane resin.

7. A composition according to claim 1, wherein from 0.1 to 200 parts by weight of said silicon resin is used based on 100 parts by weight of said siloxane resin.

8. A composition according to claim 1, 2, 3, 4, 5, 6, or 7 wherein:

the composition contains a dissipating agent for forming pores; and

the dissipating agent comprises a substance that loses its weight by 5% by weight or more at 150°C and by 90% by weight or more at 400°C when heated up at a rate of 10°C/min from usual temperature.

9. A composition according to claim 8, wherein said dissipating agent comprises at least one substance selected from the group consisting of a novolak resin, an epoxy resin, an acrylic resin, a polyester, polypropylene, a phenol

compound, an imidazole compound, and an adamantane compound.

10. A composition according to claim 8, wherein 5 to 200 parts by weight of said dissipating agent is added to 100 parts by weight of the siloxane resin.

11. A composition according to claim 8, wherein said dissipating agent is an acrylic resin.

12. A low dielectric constant film obtained by subjecting to a heat treatment a composition according to claim 1, 2, 3, 4, 5, 6, or 7.

13. A low dielectric constant film according to claim 12, having pores with a porosity in the range of from 10% to 70% by volume.

14. A low dielectric constant film:

having an SiO_4 bond, a $C-SiO_3-$ bond, and an -X- bond (wherein X is $(C)_m$ (where m is an integer in the range of from 1 to 3), or a substituted or unsubstituted aromatic group with 9 or less carbon atoms); and

having porosity in the range of from 10% to 70% by volume, and a relative dielectric constant in the range of from 1.4 to 2.5.

15. A low dielectric constant film according to claim 12, having a tensile strength at break in the range of from 30 to 80 MPa as measured by Stud Pull method.

16. A low dielectric constant film:

substantially consisting of silicon, carbon, hydrogen and oxygen; and

having a porosity in the range of from 10% to 70% by volume, a relative dielectric constant in the range of from 1.4 to 2.5, and a tensile strength at break in the range of from 30 to 80 MPa as measured by Stud Pull method.

17. A semiconductor device having, as an interlayer insulating film, a low dielectric constant film according to claim 12.

18. A semiconductor device containing a wiring comprising a copper-containing material and a low dielectric constant film according to claim 12, said wiring being formed:

by forming a metal pattern comprising a copper-containing material and surrounded with a low dielectric constant layer; and

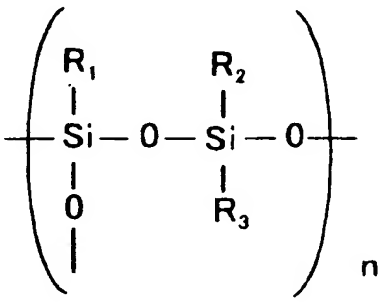
by subjecting the surface of the metal pattern to chemical-mechanical polishing together with the surface of said low dielectric constant layer in order to form said wiring or a layer of said wiring,

wherein said low dielectric constant film is formed

as a laminate and includes said dielectric constant layer as part of said laminate.

19. A method for producing a low dielectric constant film, wherein a composition comprising:

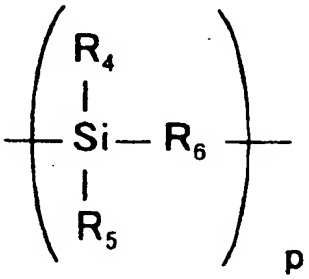
a siloxane resin having a structure represented by formula 3 below,



... (3)

(where R_1, R_2 and R_3 are each, same or different, hydrogen, fluorine, a methyl group or an -O- bond; and n is an integer in the range of from 5 to 1,000);

a silicon compound substantially consisting of silicon, carbon, and hydrogen, and having a structure represented by formula 2 below,



... (2)

(where R_4 and R_5 are each, same or different, H, an aliphatic hydrocarbon group with 1 to 3 carbon atoms, or a substituted

or unsubstituted aromatic hydrocarbon group with 6 to 9 carbon atoms; R_6 is an aliphatic hydrocarbon group with 1 to 3 carbon atoms, or a substituted or unsubstituted phenylene group; and p is an integer in the range of from 20 to 1,000), wherein the number ratio of carbon to silicon atoms forming an -X- bond (wherein X is $(C)_m$ (where m is an integer in the range of from 1 to 3), or a substituted or unsubstituted aromatic group with 9 or less carbon atoms) in the main chain of one molecule is in the range of from 2:1 to 12:1,

a solvent; and

a dissipating agent for forming pores,

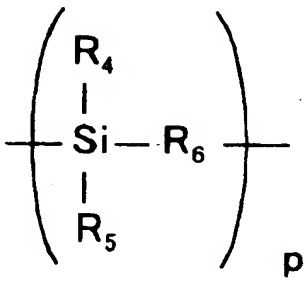
is subjected to a heat treatment so that the siloxane resin and the silicon compound are cross-linked, and the solvent and the dissipating agent are vaporized to leave pores.

20. A method for producing a low dielectric constant film wherein a composition comprising:

a siloxane resin obtained by subjecting to a heat treatment a mixture containing a tetraalkoxysilane (a) and an alkyltrialkoxysilane and/or trialkoxysilane (b) at a molar ratio (a:b) of 0:1 to 1:0, and by releasing from 100 to 400 moles of alcohols out of 100 moles of (a + b), the total of the tetraalkoxysilane (a) and the alkyltrialkoxysilane and/or trialkoxysilane (b);

a silicon compound substantially consisting of silicon, carbon, and hydrogen, and having a structure

represented by formula 2 below,



... (2)

(where R_4 and R_5 are each, same or different, H, an aliphatic hydrocarbon group with 1 to 3 carbon atoms, or a substituted or unsubstituted aromatic hydrocarbon group with 6 to 9 carbon atoms; R_6 is an aliphatic hydrocarbon group with 1 to 3 carbon atoms, or a substituted or unsubstituted phenylene group; and p is an integer in the range of from 20 to 1,000), wherein the number ratio of carbon to silicon atoms forming an -X- bond (wherein X is $(C)_m$ (where m is an integer in the range of from 1 to 3), or a substituted or unsubstituted aromatic group with 6 to 9 carbon atoms) in the main chain of one molecule is in the range of from 2:1 to 12:1;

a solvent; and

a dissipating agent for forming pores,

is subjected to a heat treatment so that the siloxane resin and the silicon compound are cross-linked, and the solvent and the dissipating agent are vaporized to leave pores.

21. A method for producing a low dielectric constant film according to claim 19 or 20, wherein said dissipating agent

comprises a substance that loses its weight by 5% by weight or more at 150°C and by 90% by weight or more at 400°C, when heated up at a rate of 10°C/min from usual temperature.

22. A method for producing a low dielectric constant film according to claim 21, wherein said dissipating agent comprises at least one substance selected from the group consisting of a novolak resin, an epoxy resin, an acrylic resin, a polyester, polypropylene, a phenol compound, an imidazole compound, and an adamantane compound.

23. A method for producing a low dielectric constant film according to claim 21, wherein from 5 to 200 parts by weight of said dissipating agent is added to 100 parts by weight of said siloxane resin.

24. A method for producing a low dielectric constant film according to claim 21, wherein said dissipating agent is an acrylic resin.

25. A method for producing a low dielectric constant film according to claim 21, wherein the carbon concentration in said siloxane resin is in the range of from 1 to 80 atom% based on the total atoms of said siloxane resin.

26. A method for producing a low dielectric constant film according to claim 21, wherein the concentration of

hydrogen atoms directly bonded to silicon in said siloxane resin is in the range of from 1 to 25 atom%, based on the total atoms in said siloxane resin.

27. A method for producing a low dielectric constant film according to claim 21, wherein from 0.1 to 200 parts by weight of said silicon compound is used based on 100 parts by weight of said siloxane resin.